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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,725	06/12/2007	Mitsuo Arima	112857-711	9416

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K&L Gates LLP
P. O. BOX 1135
CHICAGO, IL 60690

EXAMINER	
GRAMLING, SEAN P	

ART UNIT	PAPER NUMBER
2875	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/598,725	ARIMA ET AL.	
	Examiner	Art Unit	
	SEAN P. GRAMLING	2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 9, 2009 and April 10, 2009 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 14-17 and 25-26** are rejected under 35 U.S.C. 103 (a) as being unpatentable over *Olczak* (US 7,125,131) and further in view of *Nishio et al* (US 5,592,332).

4. Regarding claim 14, *Olczak* discloses an optical sheet 110 comprising a plurality of lens elements 116 provided successively in a row on one of principal faces of the optical sheet, wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis (represented by variable “r” in *Olczak*) is taken in a direction of the row of the lens elements, a cross sectional shape in the XZ plane of each of the

lens elements has a hyperboloidal or paraboloidal structure satisfies the following expression: $Z=X^2/(R+ \sqrt{(R^2-(1 + K)X^2)}) + AX^4 + BX^5 +CX^6$ where R is the radius of curvature of a distal end vertex, K is a conic constant, and A,B, and C are aspheric coefficients (see Figures 2-3 and column 2, line 63 through column 3, line 28; note: *Olczak* defines variable "c" as 1/R, and when 1/R is substituted into Equation 1, the claimed equation is obtained. *Olczak* uses variables "d", "e" and "f" as the aspheric coefficients rather than A, B, and C. Also note that the summation in column 3, lines 22-28 and discussion in column 3, lines 29-38 allows for the claimed polynomial). Although each lens elements 116 in Olczak appears hyperboloidal or paraboloidal along an entire surface (see Figures 2-3), Olczak does not specifically teach this in the description. However, the formation of lens elements with hyperboloidal or paraboloidal structures along an entire surface are well-known in the art of optical sheets and are specifically disclosed in Nishio (see Nishio, Figures 39A, 39C and 40A-B and column 19, line 9 through column 23, line 67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that an entire surface of each lens element 116 in Olczak be hyperboloidal or paraboloidal and satisfy the equation as implied by Figures 2-3 and taught by Nishio in order to increase brightness without increasing power consumption and heat generation.

5. Regarding claims 15-17, the variables satisfy the claimed numerical ranges (see column 3, lines 6-22).

6. Regarding claim 25, *Olczak* discloses a backlight comprising a light source102 for emitting illumination light; and an optical sheet 110 for raising the directivity of the

illumination light emitted from the light source; the optical sheet comprising on the illumination light emission side thereof, a plurality of lens elements 116 provided successively in a row, wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis (represented by variable “r” in *Olczak*) is taken in a direction of the row of the cylindrical lens elements, a cross sectional shape in the XZ plane of each of the lens elements satisfies the following expression: $Z=X^2/(R+\sqrt{(R^2-(1+K)X^2)}) + AX^4 + BX^5 + CX^6$ where R is the radius of curvature of a distal end vertex, K is a conic constant, and A,B, and C are aspheric coefficients (see Figures 2-3 and column 2, line 63 through column 3, line 28; note: *Olczak* defines variable "c" as 1/R, and when 1/R is substituted into Equation 1, the claimed equation is obtained. *Olczak* uses variables "d", "e" and "f" as the aspheric coefficients rather than A, B, and C. Also note that the summation in column 3, lines 22-28 and discussion in column 3, lines 29-38 allows for the claimed polynomial). Although each lens elements 116 in Olczak appears hyperboloidal or paraboloidal along an entire surface (see Figures 2-3), Olczak does not specifically teach this in the description. However, the formation of lens elements with hyperboloidal or paraboloidal structures along an entire surface are well-known in the art of optical sheets and are specifically disclosed in Nishio (see Nishio, Figures 39A, 39C and 40A-B and column 19, line 9 through column 23, line 67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that an entire surface of each lens element 116 in Olczak be hyperboloidal or paraboloidal and satisfy the equation as implied by Figures 2-3 and taught by Nishio in

order to increase brightness without increasing power consumption and heat generation.

7. Regarding claim 26, *Olczak* discloses a liquid crystal display apparatus comprising a light source102 for emitting illumination light; an optical sheet 110 for raising the directivity of the illumination light emitted from the light source, the optical sheet comprising on the illumination light emission side thereof, a plurality of lens elements 116 provided successively in a row; and a liquid crystal display panel (see paragraph [007]); wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis (represented by variable “r” in *Olczak*) is taken in a direction of the row of the lens elements, a cross sectional shape in the XZ plane of each of the lens elements satisfies the following expression: $Z=X^2/(R+ \sqrt{}(R^2-(1 + K)X^2)) + AX^4 + BX^5 +CX^6$ where R is the radius of curvature of a distal end vertex, K is a conic constant, and A,B, and C are aspheric coefficients (see Figures 2-3 and column 2, line 63 through column 3, line 28; note: *Olczak* defines variable "c" as 1/R, and when 1/R is substituted into Equation 1, the claimed equation is obtained. *Olczak* uses variables "d", "e" and "f" as the aspheric coefficients rather than A, B, and C. Also note that the summation in column 3, lines 22-28 and discussion in column 3, lines 29-38 allows for the claimed polynomial). Although each lens elements 116 in Olczak appears hyperboloidal or paraboloidal along an entire surface (see Figures 2-3), Olczak does not specifically teach this in the description. However, the formation of lens elements with hyperboloidal or paraboloidal structures along an entire surface are well-known in the art of optical sheets and are specifically disclosed in Nishio (see Nishio, Figures 39A,

39C and 40A-B and column 19, line 9 through column 23, line 67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that an entire surface of each lens element 116 in Olczak be hyperboloidal or paraboloidal and satisfy the equation as implied by Figures 2-3 and taught by Nishio in order to increase brightness without increasing power consumption and heat generation.

8. **Claims 18-24 and 27-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Olczak and Nishio* as applied to claim 14 above, and further in view of *Oda et al* (US 6,332,691).

9. Regarding claims 18, *Olczak and Nishio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions have a height equal to or greater than 0.20 micrometers and the density of the convex portions is between 70/mm^2 and 500/mm^2. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

10. Regarding claim 19, *Olczak and Nishio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions have a height equal to or greater than 0.20 micrometers and the average distance between the convex portions is between 50 and 120 micrometers. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

11. Regarding claim 20, *Olczak and Nishio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions are provided such that the cloudiness degree of the optical sheet is equal to or lower than 60 percent. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific properties claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical

sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

12. Regarding claim 21, *Olczak and Nishio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions are provided such that the cloudiness degree of the optical sheet is equal to or lower than 20 percent. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific properties claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

13. Regarding claim 22, *Olczak and Nishio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the ten-point average roughness of the convex portions is within the range of 1 micrometer to 15 micrometers. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35,

column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

14. Regarding claim 23, *Olczak and Nihsio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the height of the convex portions is within the range of 1 micrometer to 7 micrometers. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

15. Regarding claim 24, *Olczak and Nishio* do not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the average inclination gradient of the face on the side on which the convex portions are provided is equal to or lower than 0.25. However, the formation of convex portions along the surface of an optical sheet for a

backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60). Regarding claim 27, the optical sheet in Olczak does not comprise convex portions provided on the principal face side opposite to the principal face on which the lens elements 116 are formed. However, the formation of convex portions along the surface of an optical sheet for a backlight unit is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

16. Regarding claim 27, the optical sheet in Olczak does not comprise convex portions provided on the principal face side opposite to the principal face on which the lens elements 116 are formed. However, the formation of convex portions along the surface of an optical sheet for a backlight unit is well-known in the art, and is specifically

taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

17. Regarding claim 28, the optical sheet 110 in *Olczak* includes the lens elements 116 and is a single-layer element (see Figures 2-3), but does not specifically disclose the optical sheet 110 is formed by thermal transfer. However, the method of forming a device is not germane to the issue of the patentability of the device itself. Therefore, this limitation is not to be given patentable weight. Examiner notes, however, that Oda specifically teaches that the optical sheet can be manufactured through a heat-pressed method using a mold (see *Oda*, column 11,lines 57-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify the use of an integrated mold on the optical sheet 110 in Olczak for easy manufacturing of the convex portions of the optical sheet.

18. Regarding claim 29, *Olczak* teaches that the optical sheet 110 can be comprised of a transparent polymer (see paragraph [0032]), but does not specify a transparent thermoplastic resin. However, plastic resins are types of polymers and are well-known in the art for use in prism sheets. It would have been obvious to one of ordinary skill in the art at the time the invention to specify that the optical sheet 110 in Olczak be

comprised of thermoplastic resin since it has been held that the selection of a known material based on its suitability for the intended use for prior art parts does not make the claimed invention patentable over that prior art (In re Leshin, 125 USPQ 416).

19. Regarding claim 30, *Olczak* teaches that the optical sheet 110 can include at least one release agent (ultraviolet curable inorganic or organic materials, see paragraph [0032]), but does not specify that the weight be within the range of 0.02% to 0.04%. However, it would have been obvious to one of ordinary skill in the art to specify this range since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (In re Aller, 105 USPQ 233).

20. Regarding claim 31, *Olczak* teaches that the optical sheet 110 can include at least one ultraviolet absorbing agent (ultraviolet curable inorganic or organic materials, see paragraph [0032]), but does not specify that the weight be within the range of 0.02% to 0.04%. However, it would have been obvious to one of ordinary skill in the art to specify this range since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (In re Aller, 105 USPQ 233).

Response to Arguments

21. Applicant's arguments filed March 9, 2009 with respect to the rejection of the claims in the previous Office Action have been considered but are moot in view of the new ground of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN P. GRAMLING whose telephone number is (571)272-9082. The examiner can normally be reached on MONDAY-FRIDAY 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sean P Gramling
Examiner
Art Unit 2875

/SPG/
/Sharon E. Payne/
Primary Examiner, Art Unit 2875